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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER	
SAVLA, ARPAN P	

ART UNIT	PAPER NUMBER
2185	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,274	MAY ET AL.	
	Examiner	Art Unit	
	Arpan P. Savla	2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-6 and 11-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6 and 11-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 7, 2010 has been entered.

Response to Amendment

This Office action is in response to Applicant's communication filed June 7, 2010 in response to the Office action dated January 5, 2010. Claims 2-6, 11, and 12 have been amended. New claims 14-24 have been added. Claims 2-6 and 11-24 are pending in this application.

OBJECTIONS

Claims

1. **Claim 4** is objected to because the limitation "power consumer" on the last line should instead read "power consumption".

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2, 3, 11-14, 16-20, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Goldman (U.S. Patent 5,963,982).

4. **As per claims 11 and 13**, but more specifically claim 11, Goldman discloses using a null thread in a computing device to trigger initiation of defragmentation of data stored in the form of a plurality of frame pages on a memory, the memory being arranged in the form of a plurality of blocks (col. 3, lines 46-63; Fig. 2, elements 201 and 202; Fig. 3A), wherein the computing device has an operating system configured to run the null thread (col. 3, lines 31-34; Fig. 1, elements 10 and 12); *It should be noted that the computer system being "idle" means an idle process (i.e. idle/null thread) is running. See the "Background of the Invention" in Applicant's specification, specifically the last paragraph of page 1, for a discussion of an idle/null thread.*

restricting defragmentation of the data to occur only in an instance in which it is determined that the frame pages of data after defragmentation can be held in a reduced number of blocks of memory in comparison to prior to defragmentation (col. 3, lines 50-54; Fig. 2, element 202; col. 4, lines 23-27; Fig. 3B). *It should also be noted that Goldman discloses the stored data is "compacted" (i.e. the unused space is removed) during the defragmentation routine, therefore, it follows that Goldman discloses "the*

frame pages of data after defragmentation can be held in a reduced number of blocks of memory in comparison to prior to defragmentation".

5. **As per claim 11**, Goldman discloses an apparatus having an operating system configured to run a null thread (col. 3, lines 31-34; Fig. 1, elements 10 and 12), the apparatus comprising:

means for using the null thread to trigger initiation of defragmentation of data stored in the form of a plurality of frame pages on a memory, the memory being arranged in the form of a plurality of blocks (col. 3, lines 46-63; Fig. 2, elements 201 and 202; Fig. 3A); *See the citation note for the similar limitation in the rejection of claims 11 and 13 above.*

means for restricting defragmentation of the data to occur only in an instance in which it is determined that the frame pages of data after defragmentation can be held in a reduced number of blocks of memory in comparison to prior to defragmentation (col. 3, lines 50-54; Fig. 2, element 202; col. 4, lines 23-27; Fig. 3B). *See the citation note for the similar limitation in the rejection of claims 11 and 13 above.*

6. **As per claim 14**, Goldman discloses a method comprising:

detecting running of a null thread on a computing device having an operating system configured to run the null thread (col. 3, lines 31-34 and 49-50; Fig. 1, elements 10 and 12; Fig. 2, element 201); *It should be noted that "determining the computer system is idle" is equivalent to "detecting running of a null thread on a computing device". Also, see the citation notes in the rejection of claims 11 and 13 above.*

and in response to detecting running of the null thread, triggering, by a processor, initiation of defragmentation of data stored in the form of a plurality of frame pages on a memory arranged in the form of a plurality of blocks (col. 3, lines 50-54; Fig. 2, element 202). *See the citation notes in the rejection of claims 11 and 13 above.*

7. **As per claim 17**, Goldman discloses an apparatus comprising at least one processor and at least one memory storing computer program code (col. 3, lines 31-34; Fig. 1, elements 10 and 12), wherein the at least one memory and stored computer program code are configured, with the at least one processor, to cause the apparatus to at least:

detect running of a null thread (col. 3, lines 49-50; Fig. 2, element 201); *See the citation note for the similar limitation in the rejection of claim 14 above.*

and in response to detecting running of the null thread, trigger initiation of defragmentation of data stored in the form of a plurality of frame pages on a memory arranged in the form of a plurality of blocks (col. 3, lines 50-54; Fig. 2, element 202). *See the citation notes in the rejection of claims 11 and 13 above.*

8. **As per claim 3**, Goldman discloses the null thread comprises code for causing a further code to perform the defragmentation of the data (col. 3, lines 46-56; Fig. 2, elements 201 and 202).

9. **As per claim 4**, Goldman discloses the said thread comprises a thread of operating system code for causing the computing device to adopt a reduced power mode by placing a central processing unit of the computing device into a standby mode, thereby to further reduce the power consumption from the power resources of the

computing device (col. 3, lines 46-56; Fig. 2, elements 201 and 202). *It should be noted that when the computer system is "idle" the CPU is not receiving input from any I/O device (see col. 6, lines 26-27), thus, it follows that the CPU is in a "standby mode".*

10. **As per claims 16 and 24**, Goldman discloses in an instance in which defragmentation is completed prior to a thread other than the null thread being ready to run, further comprising causing the computing device to enter a standby mode (col. 3, lines 46-56; Fig. 2). *It should be noted that if the defragmentation completes and there are no other threads ready to run, it follows that the computer system will go back to "idle". As discussed in the rejection of claim 4 above, when the computer system is idle is in a "standby mode".*

11. **As per claim 18**, Goldman discloses the null thread comprises a thread run in an instance in which no other thread is ready to run (col. 3, lines 49-50; Fig. 2, element 201). *It should be noted that when the computer system is "idle" no other threads are running. Also, see the citation note for the first limitation in the rejection of claims 11 and 13 above.*

12. **As per claim 19**, Goldman discloses the at least one memory and stored computer program code are configured, with the at least one processor, to further cause the apparatus to:

determine whether defragmentation of the data will result in frame pages of the data being held in a reduced number of blocks of memory in comparison to a number of blocks of memory in which the data is held prior to defragmentation (col. 3, lines 49-50; Fig. 2, element 201; col. 3, lines 60-67; col. 4, lines 24-27; Fig. 3A; Fig. 3B, element 45);

As can be seen from comparing Fig. 3A and Fig. 3B, defragmentation (i.e. compacting of stored) always results in removal of unused memory space (i.e. frame pages of the data being held in a reduced number of blocks of memory in comparison to a number of blocks of memory in which the data is held prior to defragmentation).

and wherein the at least one memory and stored computer program code are configured, with the at least one processor, to cause the apparatus to trigger initiation of defragmentation of the data only in an instance in which it is determined that defragmentation of the data will result in frame pages of the data being held in a reduced number of blocks of memory (col. 3, lines 50-54; Fig. 2, element 202; col. 4, lines 23-27; Fig. 3B). *See the citation note for the similar limitation in the rejection of claims 11 and 13 above.*

13. **As per claim 20**, Goldman discloses the null thread comprises a thread of operating system code configured to cause the apparatus to adopt a reduced power mode by placing the at least one processor into a standby mode, thereby reducing power consumption from a power resource of the apparatus (col. 3, lines 46-56; Fig. 2, elements 201 and 202). *See the citation note for the rejection of claim 4 above.*

As per claim 22, Goldman discloses in an instance in which defragmentation is completed prior to a thread other than the null thread being ready to run, the at least one memory and stored computer program code are configured, with the at least one processor, to cause the apparatus to enter a standby mode (col. 3, lines 46-56; Fig. 2). *See the citation note for the rejection of claims 16 and 24 above.*

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 2, 5, 15, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldman in view of Altare (U.S. Patent Application Publication 2004/0148476).

16. **As per claim 5**, Goldman discloses the said thread (col. 3, lines 33-42 and 46-56; Fig. 2).

Goldman does not disclose the null thread comprises a thread which is configured to be a first thread to run at boot time of the computing device.

Altare discloses a defragmentation thread which is configured to be a first thread to run at boot time of the computing device (paragraphs 0016-0017 and 0037).

Goldman and Altare are analogous because they are from the same field of endeavor, that being defragmentation of memory systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Altare's boot time defragmentation thread and Goldman's idle process (i.e. idle thread). The motivation for doing so would have been to assure defragmentation doesn't conflict with other applications, thus, improving overall system performance.

17. **As per claim 2**, the combination of Goldman/Altare discloses the null comprises

code for performing the defragmentation of the data (Goldman, col. 3, lines 46-56; Fig. 2; Altare, paragraphs 0016-0017 and 0037). *See the rejection of claim 5 above which describes the combination of Altare's boot time defragmentation thread and Goldman's idle process (i.e. idle thread).*

18. **As per claims 15 and 23**, the combination of Goldman/Altare discloses in an instance in which a hardware interrupt is asserted prior to completion of defragmentation, reverting to handling of a new thread which is ready to run (Altare, paragraph 0036). *It should be noted that when the "user works with the machine" a hardware interrupt is initiated (which stops the defragmentation) and a new thread begins to run (the thread corresponding to whatever program the user is using on the machine).*

19. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldman in view of Czajkowski et al. (U.S. Patent 6,453,403) (hereinafter "Czajkowski").

20. **As per claim 6**, Goldman discloses all the limitations of claim except the computing device is selected to comprise a wireless information device.

Czajkowski discloses a computing device is selected to comprise a wireless information device (col. 5, lines 4-10; Fig. 1).

Goldman and Czajkowski are analogous because they are from the same field of endeavor, that being managment of memory systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply Goldman's RAM defragmentation routine, a known technique, to

Czajkowski's wireless information device, a known device ready for improvement to yield the predictable results of defragmenting stored data without requiring pointer indirection in a wireless computing environment.

Response to Arguments

21. Applicant's arguments filed June 7, 2010 have been fully considered but they are not persuasive.

22. With respect to Applicant's argument that "Goldman fails to teach or suggest use of a null thread to trigger initiation of defragmentation of data", which appears on pages 9-10 of the communication filed June 7, 2010, the Examiner respectfully disagrees. Firstly, as briefly mentioned in the rejection above, in Goldman, when the computer system is "idle" some sort of idle process (i.e. idle thread) is running. Such an idle process/thread is well know in the art and is even described by Applicant in the "Background of the Invention" section of Applicant's specification. The Examiner particularly notes the last paragraph on page 1 of Applicant's specification which states "A typical operating system will schedule many different threads in order to control the variety of tasks to be carded out by the computing device. One of these threads, often referred to as the 'null' thread or 'idle' thread, is distinguished from all other threads in that it runs if, and only if, there are no other threads eligible for execution (ready to run), i.e. if the system is, in essence, idle." (emphasis added) Thus, it is quite clear that when Goldman's computer system is idle is running Applicant's null thread, as simply and broadly claimed.

Keeping that in mind, the Examiner refers Applicant to Fig. 2 of Goldman. As can be seen from elements 201 and 202, when the system is idle data is compacted (i.e. defragmented). Col. 3, lines 49-51 of Goldman state, "In step 201, it is determined whether the computer system 1 is idle (i.e., receiving no input). If so, then in step 202 the stored data is defragmented (i.e., compacted)", with col. 3, lines 54-56 further stating "If, in step 201, the system is not idle, then the system 1 waits until the system becomes idle before defragmenting the data." (emphasis added) Thus, it is quite clear that Goldman's defragmentation is completely reliant on whether the computer system is idle or not. Consequently, the Examiner submits that Goldman's idle state triggers initiation of defragmentation of data. Therefore, Goldman sufficiently discloses using an idle (i.e. null) thread to trigger initiation of defragmentation of data.

Furthermore, the Examiner disagrees with Applicant's allegation that Goldman teaches away from this feature. Applicant states that col. 3, lines 10-13 of Goldman teach that defragmentation is performed "when the computer is not receiving input", however, the Examiner submits that Applicant is mischaracterizing what Goldman's statement actually entails. The Examiner refers Applicant to a portion of Goldman's claim 1 which states "while the processor is not receiving input from any I/O device, defragmenting the stored data by performing the steps of…". (emphasis added) Thus, when taking into account the actual claim language, it follows that the statement "when the computer is not receiving input", which appears in the detailed description, is actually concerned with input from the I/O devices (such as any input coming in from sources external to the computer system, e.g. a keyboard, mouse, etc.). The Examiner

submits that "not receiving input from any I/O device" does not preclude the processor from receiving input from the RAM and/or ROM (where the idle process/thread would be stored) while in an idle state. Accordingly, based on the foregoing, Goldman anticipates the independent claims.

23. As for Applicant's arguments with respect to the dependent claims, the arguments rely on the allegation that the independent claims are patentable and therefore for the same reasons the dependent claims are patentable. However, as addressed above, the independent claims are not patentable, thus, Applicant's arguments with respect to the dependent claims are not persuasive.

Conclusion

STATUS OF CLAIMS IN THE APPLICATION

The following is a summary of the treatment and status of all claims in the application as recommended by MPEP 707.70(i):

CLAIMS REJECTED IN THE APPLICATION

Per the instant office action, **claims 2-6 and 11-24** have received an action on the merits and are subject of a non-final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arpan P. Savla whose telephone number is (571) 272-1077. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arpan P. Savla/
Examiner, Art Unit 2185
June 21, 2010